

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Show all work!

$$\text{Probability} = \frac{\text{\# successes}}{\text{total \# outcomes}}$$

Odds Success : failure

### Check for Understanding

- Concept Check**
- OPEN ENDED** Describe an event that has a probability of 0 and an event that has a probability of 1.
  - Write the probability of an event whose odds are 3:2.
  - Verify the probabilities given for sums of 2 and 3 in Example 4.

**Guided Practice** Suppose you select 2 letters at random from the word *compute*. Find each probability.

- $P(2 \text{ vowels}) = \frac{{}^3C_2}{{}^7C_2}$
- $P(2 \text{ consonants})$
- $P(1 \text{ vowel}, 1 \text{ consonant})$

Find the odds of an event occurring, given the probability of the event.

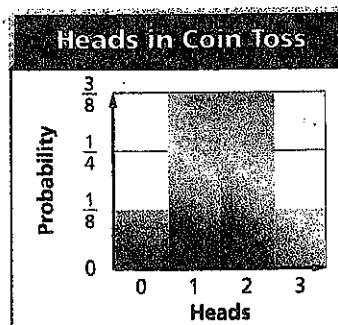
- $\frac{8}{9}$
- $\frac{1}{6}$
- $\frac{2}{9}$

Find the probability of an event occurring, given the odds of the event.

- 6:5
- 10:1
- 2:5

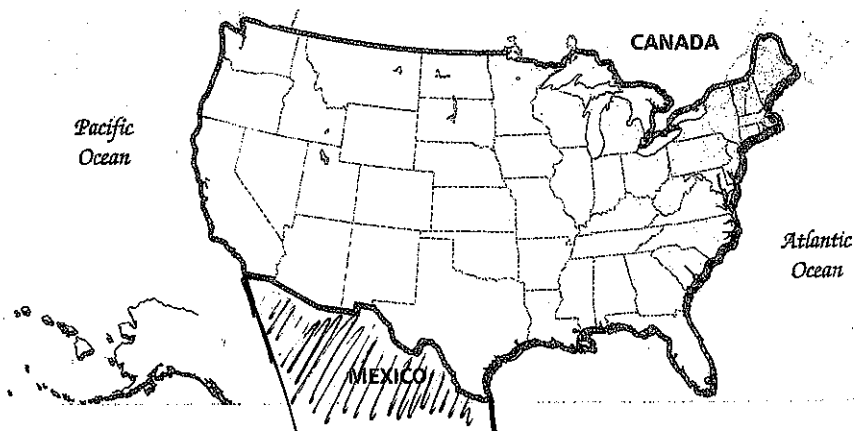
The table and the relative-frequency histogram show the distribution of the number of heads when 3 coins are tossed. Find each probability.

$H = \text{Heads}$	0	1	2	3
Probability	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$



- $P(H = 0)$
- $P(H = 2)$

**Application** **GEOGRAPHY** For Exercises 15–18, find each probability if a state is chosen at random from the 50 states.



- $P(\text{next to the Pacific Ocean})$
- $P(\text{borders Mexico})$
- $P(\text{has at least five neighboring states})$
- $P(\text{is surrounded by water})$

# Practice and Apply

## Homework Help

For Exercises	See Examples
19–33, 54	1, 2
34–53	3
55–60	4

Extra Practice  
See page 854.

12 rock  
8 jazz  
5 classical

Ebony has 4 male kittens and 7 female kittens. She picks up 2 kittens to give to a friend. Find the probability of each selection.

19.  $P(2 \text{ male})$       20.  $P(2 \text{ female})$       21.  $P(1 \text{ of each})$

Bob is moving and all of his CDs are mixed up in a box. Twelve CDs are rock, eight are jazz, and five are classical. If he reaches in the box and selects them at random, find each probability.

22.  $P(3 \text{ jazz})$       23.  $P(3 \text{ rock})$   
 24.  $P(1 \text{ classical}, 2 \text{ jazz})$   $\frac{5C_1 \cdot 8C_2}{25C_3}$       25.  $P(2 \text{ classical}, 1 \text{ rock})$   
 26.  $P(1 \text{ jazz}, 2 \text{ rock})$       27.  $P(1 \text{ classical}, 1 \text{ jazz}, 1 \text{ rock})$   
 28.  $P(2 \text{ rock}, 2 \text{ classical})$       29.  $P(2 \text{ jazz}, 1 \text{ reggae})$

30. **LOTTERIES** The state of Florida has a lottery in which 6 numbers out of 53 are drawn at random. What is the probability of a given ticket matching all 6 numbers in any order?

• **ENTRANCE TESTS** For Exercises 31–33, use the table that shows the college majors of the students who took the Medical College Admission Test (MCAT) in April 2000.

If a student taking the test were randomly selected, find each probability. Express as decimals rounded to the nearest thousandth.

31.  $P(\text{math or statistics})$   
 32.  $P(\text{biological sciences})$   
 33.  $P(\text{physical sciences})$

Major	Students
biological sciences	15,819
humanities	963
math or statistics	179
physical sciences	2770
social sciences	2482
specialized health sciences	1431
other	1761

Find the odds of an event occurring, given the probability of the event.

34.  $\frac{1}{2}$       35.  $\frac{3}{8}$       36.  $\frac{11}{12}$       37.  $\frac{5}{8}$   
 38.  $\frac{4}{7}$       39.  $\frac{1}{5}$       40.  $\frac{4}{11}$       41.  $\frac{3}{4}$

Find the probability of an event occurring, given the odds of the event.

42. 6:1      43. 3:7      44. 5:6      45. 4:5  
 46. 9:8      47. 1:8      48. 7:9      49. 3:2

50. **GENELOGY** The odds that an American is of English ancestry are 1:9. What is the probability that an American is of English ancestry?

**GENETICS** For Exercises 51 and 52, use the following information.

Eight out of 100 males and 1 out of 1000 females have some form of color blindness.

51. What are the odds of a male being color-blind?  
 52. What are the odds of a female being color-blind?

53. **EDUCATION** Josefina's guidance counselor estimates that the probability she will get a college scholarship is  $\frac{4}{5}$ . What are the odds that she will not earn a scholarship?

## More About



## Entrance Tests

In addition to the MCAT, most medical schools require applicants to have had one year each of biology, physics, and English, and two years of chemistry in college.